

Spatial Watershed Iterative Loading (SWIL) Model Update
Indian River Lagoon (IRL) Basin Management Action Plans (BMAPs)

October 18, 2021, 1:30 pm – 2:46 pm

Via GoToWebinar

Attendees

Carolina Alvarez, Brevard County
Jana Ash, E Sciences
Steven Baker, USAF
Virginia Barker, Brevard County
Venetia Barnes, City of Fort Pierce
Tom Bradford, City of West Melbourne
Terri Breeden, Brevard County
Scott Brown, City of Rockledge
Jessica Bruso, City of Cocoa Beach
Katherine Caricchio, AECOM
Timothy Carlisle, City of Cape Canaveral
Eric Charest, Indian River County
Jeffrey Collins, NASA
Randy Coslow, City of Edgewater
Patrick Dayan, St. Lucie County
Doug Durham, NASA
Mark Ellard, Geosyntec
Yesenia Escribano, FDACS
Allison Fetigan, FDOT
Brandon Friedman, St. Lucie County
Michele Frost, USACE
Lisa Good, City of Melbourne
Heather Goslin, USAF
Maddy Hart, FDACS
Janet Hearn, ETM
Scott Hodges, WSVN/Vero Lakes WCD

Charles Jacoby, SJRWMD
Tom Jobes, SJRWMD
VJ Karycki, City of Rockledge
Robert Kline, NASA
Molly Klinepeter, Indian River County
James Lappert, St. Lucie County
Olkeba Leta, SJRWMD
Robert Loring, City of Fellsmere
Mark Mathes, City of Fellsmere
Matthew Mitts, City of Vero Beach
Abigail Morgan, City of Cocoa
Lisa Morrell, Town of Malabar
Edward Northey, FDOT
Elon Poole, City of Rockledge
Robert Potts, E Sciences
Sandra Reller, City of Titusville
Mark Ryan, City of Indian Harbour Beach
Douglas Scheidt, NASA
Kevin Shropshire, City of Rockledge
George Simons, Carter & Associates
Bryant Smith, City of Coca
Cherry Stowe, Town of Orchid
J. Danielle Straub, City of Melbourne
Jose Vega, St. Lucie County
Frank Watanabe, City of Palm Bay

Opening Remarks

Stacy welcomed everyone to the webinar. Stacy reviewed the GoToWebinar features and how to use them.

Overview of SWIL Updates

Stacy reviewed the timetable of the total maximum daily loads (TMDLs) and the development of the SWIL Model.

Review of Surface Data

Timeline

Claudia Listopad reviewed the timeline for the SWIL Model update. The focus in the past two months has been an update to the direct runoff input layers and starting on the subsurface (SSF) flow input layers. Task 3 is an optional task on which we need consensus before moving forward.

Previous Decisions

Previous decisions that were made include modeling the timeframe from 2010 to December 2020. Instead of the two input years previously used, now using three years—2010 (2010-2013), 2015 (2014-2017), and 2020 (2018-2020). The idea is to capture what happened and when it happened, particularly urbanization in the last 10 years. The direct runoff model is based on event mean concentration (EMC)-based and that basis will continue. The complexity of the baseflow module is still under evaluation and is reliant on the datasets received from stakeholders.

For the direct runoff model input layers, Claudia reviewed the input data needed to run the model. These input layers include basin boundaries, rainfall, evapotranspiration (ET), land use and land cover, soils, environmental resource permit (ERP) treatments, direct runoff coefficients (ROCs), direct runoff EMCs, and impoundments and their management schedule.

Boundaries/Diversions

Claudia reviewed the data requests from stakeholders and the deadline for responses. The data deliveries were reviewed and quantified by their relevance to the model inputs; their representation of the time period; and meeting data format and standards. The basin boundaries were reviewed to match the BMAP and the SWIL Model boundaries. Minor discrepancies exist where basin boundaries meet. In the last SWIL iteration included the Fellsmere area in the Central IRL (CIRL) which has now been removed due to diversion to the Upper St. Johns River (USJR). The C-1 Canal Phase 1 project will be included in the model and reductions will be made based on measured flow data. A map was shown that showed the previous boundary and the current boundary.

Rainfall

For rainfall, 120 monthly rasters were developed from National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) NEXRAD data which are supplied to and used by the St. Johns River Water Management District (SJRWMD).

ET

For ET, this effort to update the ET is in progress. An interpolation value is used because for urban-built areas, there are no values provided and those need to be filled in. Previously, the SWIL Model used the University of Montana's dataset, and those data are no longer being generated after 2015. So, a MODIS grid will be converted to points and an inverse distance weighted (IDW) interpolation will be performed to complete the ET values for the modeled area including the urban areas.

Land Use/Land Cover

Land use and land cover were also discussed. For the SWIL update, they started with the 2020 land use. The Florida Land Use Cover and Forms Classification System (FLUCSS) data for 2020 are not yet available, so the model team started with the FLUCSS 2015 layers. For natural lands, if they have not been urbanized, the natural areas were kept the same. For areas that are considered to be agricultural land uses by the Florida Department of Agriculture and Consumer Services (FDACS), the model will use that information. A comparison was done between the water management districts (WMDs) and FDACS land use information. An important update is that 655 acres of "Mixed Rangeland" will be reclassified as "Unimproved Pasture" instead of "Dry Prairie."

For urban areas, the county-specific property appraiser data were used. In some cases, there were multiple codes used for a single parcel. Look up comparison tables were created for each county based on their own county codes and datasets. Figures representing the conversion rules applied were made for each county. We need your feedback on these look up comparison tables to make sure they are correct. Feedback is due by October 29, 2021. Where green areas are shown on a map, those areas are considered high density residential. In blue, the WMD FLUCSS areas are used (natural or agricultural areas). In yellow, they used the property appraiser data, and the property size were considered. Areas in red, the imagery was consulted to determine the best land use to assign. Once feedback is received, the land use will be assigned for the entire area. Then the same process will be used to assign 2010 and 2015 land uses. Once completed, the layers will be posted to the DEP site for your review and additional feedback.

For agricultural areas, a single category of pasture will now be divided into distinct categories of improved pasture, unimproved, and cattle feeding operations. Row crops will be divided into row crops or field crops.

Soils

Soils were updated to the most recent dataset. The Gridded Soil Survey Geographic Database was used (gSSURGO). Claudia showed pie charts that compared the previous SWIL Model soil distribution with the new soil distribution. Claudia reviewed how the urban soils are filled in where the aerial photo interpretation (API) is used to match urban soils to surrounding areas.

EMCs

Claudia reviewed the information received on EMCs. The focus has been on updating the EMCs for those stakeholders who have provided additional information. Applied Ecology Inc. (AEI) and the Florida Department of Environmental Protection (DEP) will provide a handout on EMCs by the end of October.

Runoff Coefficients (ROCs)

Direct ROCs will continue to be used based on the soil conservation curve number method. The update will keep monthly ROCs for the previous/existing consolidated land uses. The monthly values are organized by land use and soil type. Claudia shows a table of the monthly C values. ROCs are typically highest in September/October when soils are most saturated, and the values are lowest in the dry season.

Impoundments

Impoundments and their management is important. If a system is a wetland and always connected, the area will act like other parts of the model. If you have information that the schedule or impoundments has changed since 2017, please notify Stacy. If it is a connected, wetland system it will not be treated like an impoundment in the model.

ERP Treatment

The way stormwater ERP treatment is included in the model is being reflected in 2010, 2015, and 2020. There are two types of ERP treatment applied—dry or wet ponds. The runoff volume and removal are from Harvey Harper's research.

Baseflow Module

Coming next is the baseflow module. Brevard County has provided data on 45 wells in different types of areas (e.g., septic, sewer, sewer with reclaimed, and natural control areas). Other groundwater well data were provided by South Florida Water Management District (SFWMD) (no nutrient data) and Indian River County (39 wells sampled for one quarter and 18 wells with one sample event per year from 2015-2021). The representation of treatment types (e.g., septic, sewer, sewer with reclaimed, and natural control areas) are being determined.

Brevard County provided all septic and reclaimed water parcels. Indian River County provided their sewer inventory. Some limited reuse data were available from City of Vero Beach. AEI created a spatial septic inventory based on the best available data in the entire watershed.

The data upload available for review will include the following:

- ET rasters will be posted once finalized.
- Rainfall rasters are almost done—they are awaiting additional NEXRAD data from SJRWMD.
- Land use feedback needed ASAP from local governments.
- ERP Treatment Layers are dependent on the land use layers, so those will be finished after the land uses are finalized.
- Final EMC values will use new agriculture and transportation values.
- ROC values will include new land use categories that have been further refined.

In Task 2 and beyond, a comprehensive feature class containing all wells associated with summary monitoring data will be created. Also, a comprehensive feature class of septic/reclaimed parcels with the best available data will be posted. Then the summary data for calibration basins for hydrological and water quality. Hydrological calibration will be performed but there are still questions on whether water quality calibration can be accomplished with the data available.

Questions

Tom Jobes noted that there is a part of the removed area around Fellsmere that can still flow to either basin. Stacy offered to follow up with Tom; DEP checked with SJRWMD/Chuck Jacoby about the boundary and the area contributing to the IRL. Claudia noted that if an area is partially diverted, we can include that partial diversion. Tom added the area is small relative to the total basin, and none goes full-time to IRL, so you may be good as is. Stacy will follow up with Tom to confirm any boundary questions.

Marcy noted that Yesenia asked about the pasture categories that were discussed with FDACS were going to be improved pasture, unimproved, and woodland. FDACS indicated it is unlikely there are cattle feeding operations but also added that the direct run off EMC slide has the correct categories. DEP noted in the chat that they are still sorting through the information to propose updated EMCs and then we'll share the results with FDACS for review before finalizing.

Patrick Dayan asked is the task requested of stakeholders to verify the rules for land uses or to qualify the land uses themselves? Claudia responded that we want a review of the rules now, but later you will also have a chance to review the maps in case they are incorrect. Once we have a chance to finalize the land use you will have a chance to review and provide comments on that too.

Virginia Barker asked how are you classifying ag that is not enrolled in FDACS best management practices (BMPs)? Claudia stated that we are not using enrollment for the land use/land cover classification but are using the types of agriculture on the landscape. If an area is not enrolled in the FDACS BMP Program, it will still be classified as agriculture.

Jose Vega asked if DEP would provide access to the shapefile for stakeholders to review. Claudia responded that all the shapefiles will be provided. The model/basin boundary has been provided already. The land use has not been posted yet until feedback on the land use rules has been provided. The rule workbooks are already posted as well as PDF maps for this review. Jose noted that it would be easier for stakeholders to review using a geographic information system (GIS). In the chat, DEP responded that the updated GIS files have not been created yet. If it would help to have different PDF maps, please reach out to Stacy.

Yesenia asked if DEP will be using other datasets already part of the analysis (such as septic tanks or service areas) to further validate if something is urban? Stacy Claudia noted that the septic layer was not intended to be used as the defining layer for an urban land use. The property appraiser dataset is more accurate for this purpose. Also, you can have septic systems in areas that are not urban, so those data would not be used to define what is urban. Yesenia agreed with using the property appraiser data.

Stacy showed the file transfer protocol (FTP) site link which will be in the posted PowerPoint today. Please review the rules for the land use data and the boundary and provide comments by October 29, 2021.

Task 3 is a data dependent task to see if there were enough data to expand the subsurface module with reuse and septic nutrient information. There are areas with a lot of information and some areas where there is no data. The question is, "What is the best way to use the data moving forward?" Stacy put up a poll question for attendees. Option A was, "Extrapolate the best datasets across the watershed." Option B was, "Apply submitted local sites-specific data to just those areas." Option C was, "This is a data gap to focus on in the next modeling period." Yesenia asked about the areas that have data versus those that don't. Stacy described the geographic areas with data. The participants responded to the poll. Anyone can email Stacy after the meeting if you have further feedback.

Stacy added that in Task 4 there was an optional step to include some completed BMPs in the model. DEP has decided to include completed structural projects submitted to DEP in the BMAP through 2015. Those projects will reduce the amount of starting load with the BMPs and will be based on the efficiencies used for the BMAPs. You can see the BMP efficiencies in the BMP guidance document

posted online. Including the structural BMPs will improve starting loads from model outputs. The projects will remain in project tables but not sum in the progress reductions as we move forward. This is included to simplify the calibration steps and to provide small starting loads for stakeholders.

Stacy reported that the 2020 Statewide Annual Report (STAR) is posted online. The 2021 STAR process will begin soon. You can also download the dataset associated with the 2020 STAR report. To streamline the collection process in future years, DEP is working on creating a project portal to provide updates instead of the Excel workbook process. In late 2021 there will be a pilot test of the portal. The pilot testing runs at the same time as the regular STAR process. For those not in the pilot test, the traditional process will apply for STAR 2021. DEP expects to run the portal for everyone in the 2022 season. Matthew Mitts commented that the portal is a great idea.

Next Steps

Please review the land use and boundary data available on the DEP FTP site. Notification will go out when the remaining surface data are available and are posted. AEI will finish evaluating subsurface data. Feel free to provide additional feedback to Stacy via email on how to approach the subsurface update. The 2021 STAR process starts in November. An annual meeting on the three IRL BMAPs is expected to be held in December. Stacy provided contact info for herself and Kevin Coyne.

Questions, Comments, Discussion

Maddy asked if ag cost share projects will be included as structural projects in the model, or will the projects in the model only be urban projects? Stacy responded that DEP is still discussing how to consider those efforts but is leaning towards including agricultural structural projects as well as urban structural projects. Virginia asked about whether no BMAP credit will be issued for retrofit projects completed before 2016. Stacy responded that any projects completed through 2015 will be in the model, so the stakeholder will receive credit for them. As the meeting ended, Virginia expressed a concern that jurisdictions that started work recently will be rewarded with credits the same as those who have been implementing projects for decades. Stacy will follow up with Virginia to explain that the credits won't be added to the progress charts because they will have already decreased the starting load and the local entities will receive credit on the front end (in their lower starting loads) for the earlier projects.

The meeting ended at 2:46 pm.

Action Items

All—We need your feedback on the look up land use comparison table and proposed rules to make sure they are appropriate. Feedback is due by October 29, 2021.

Stacy—Follow up with Virginia Barker on her questions about how the structural projects will be credited for the allocated entities.

AEI/DEP—A handout on EMCs will be provided by the end of October.

All—If you have information that the schedule or impoundments has changed since 2017, please notify Stacy. If the area is connected without any maintenance or specified release schedule, it will be considered as a wetland system and it will not be treated like an impoundment in the model.